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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,038	09/12/2003	Cheng T. Horng	HT03-006	6707

7590 07/19/2006

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POUGHKEEPSIE, NY 12603

EXAMINER
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MCDONALD, RODNEY GLENN

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 07/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/661,038

Applicant(s)

HORNG ET AL.

Examiner

Rodney G. McDonald

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 13-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 12/2003, 3/2006.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of Group I, claims 1-12 in the reply filed on May 9, 2006 is acknowledged. The traversal is on the ground(s) that the process claims necessarily use the product and vice versa and therefore the field of search must necessarily cover both the product and process. This is not found persuasive because the product can be made by another and materially different process such as utilizing another process such CVD instead of "using an ultra-low pressure Ar/O<sub>2</sub> mixture as a sputtering gas".

The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Rejections - 35 USC § 112***

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 1, is indefinite because the phrase "ultra-thin" lacks basis for comparison.

Claim 1, line 2, is indefinite because "high" lacks basis for comparison.

Claim 1, lines 4, 5, 11, 14, 16, 18, is indefinite because "ultra-low" lacks basis for comparison.

Claim 3, lines 1, 2, is indefinite because "ultra-low" lacks basis for comparison.

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hoshiya et al. (U.S. PG PUB 2002/0041473) and Kula et al. (U.S. PG PUB 2003/0021071) teach spin valve sensors but fail to teach forming the spin valve GMR sensor element as claimed by applicant including the specifics for depositing the layers in the sputtering chamber.

***Allowable Subject Matter***

Claims 1-12 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 1-12 are indicated as being allowable over the prior art of record because the prior art of record does not teach a method for forming a spin valve GMR sensor element with layers having sub-atomic monolayers of oxygen absorbed on the surfaces thereof comprising providing, in an ultra-low base pressure sputtering chamber, a substrate; forming on the substrate, using an ultra-low pressure Ar/O<sub>2</sub> mixture as a sputtering gas, a seed layer; forming, using said sputtering gas, an antiferromagnetic pinning layer on the seed layer; forming, using the sputtering gas, a synthetic antiferromagnetic (SyAF) pinned layer formed on the pinning layer; forming, using only ultra-low pressure Ar as a sputtering gas, a Cu spacer layer on the SyAF layer, the surface of the spacer layer not contacting the SyAF layer then being treated with O<sub>2</sub> to

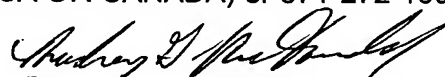
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form an oxygen surfactant layer (OSL); forming, again using the ultra-low pressure Ar/O<sub>2</sub>, a ferromagnetic free layer on the OSL of the treated spacer layer; forming, using only ultra-low pressure Ar as a sputtering gas, a Ru capping layer on the ferromagnetic free layer, then forming an OSL layer on the Ru layer; forming, using the ultra-low pressure Ar/O<sub>2</sub> mixture as a sputtering gas, a Ta capping layer on the Ru capping layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rodney G. McDonald whose telephone number is 571-272-1340. The examiner can normally be reached on M- Th with Every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
Rodney G. McDonald  
Primary Examiner  
Art Unit 1753

RM  
July 11, 2006